Disease Name — Maple syrup urine disease

Alternate name(s)	Branched chain ketoaciduria, Branched chain alpha-keto dehydrogenase deficiency
Acronym	MSUD type 1A, BCKD deficiency
Disease Classification	Amino Acid Disorder
Variants	Yes
Variant name	MSUD type 1B, MSUD Type II, Intermittent branched-chain ketoaciduria, Intermediate branched-chain ketoaciduria, Thiamine responsive MSUD
Symptom onset	Neonatal with some variability
Symptoms	Lethargy progressive to coma and possible death, vomiting, difficulty feeding, opisthotonic posturing, hypoglycemia, possible high pitched cry.
Natural history without treatment	Neurologic abnormalities and profound mental retardation.
Natural history with treatment	Normal IQ and development may be expected if treatment is initiated before first crisis, but development is delayed in the severest cases.
Treatment	Dietary restriction of the branched chain amino acids and supplementation with medical formula. Thiamine supplementation in thiamine responsive patients.
Other	"Maple syrup"-like odor to urine (usually present during crisis)
Emergency Medical Treatment	See sheet from American College of Medical Genetics (attached) or for more information, go to website: http://www.acmg.net/StaticContent/ACT/Leucine.pdf
Physical phenotype	None
Inheritance	Autosomal recessive
General population incidence	1:200,000
Ethnic differences	Yes
Population	Mennonites, French-Canadians
Ethnic incidence	1/760 (Mennonites)
Enzyme location	Inner mitochondrial membrane; liver, kidney, leukocytes and fibroblasts.
Enzyme Function	Catalyzes the decarboxylation of oxoacids.
Missing Enzyme	Branched-chain ketoacid dehydrogenase (BCKAD). This enzyme is a multienzyme complex with 3 components – E1, E2 and E3.
Metabolite changes	Increased leucine, isoleucine and valine in plasma and urine, increased organic acids in urine.
Prenatal testing	Enzyme testing by CVS or amnio. If mutation is known, DNA testing may be available.
MS/MS Profile	Leucine elevated, leucine to alanine ratio elevated.
OMIM Link	http://www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=248600
Genetests Link	www.genetests.org
Support Group	The MSUD Family Support Group http://www.msud-support.org National Coalition for PKU and Allied Disorders http://www.pku-allieddisorders.org/ Children Living with Inherited Metabolic Diseases http://www.climb.org.uk/

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